1	In the claims:
2	1. A flex circuit for use in a fuel cell, the flex circuit, comprising:
3	a fuel-side flexible circuit, comprising:
4	a first flex substrate, wherein the first flex substrate comprises openings
5	through which pass liquid fuel,
6	a first porous layer adjacent the first flex substrate, the first porous layer
7	including a first catalyst layer,
8	an anode electrode between the first flex substrate and the first porous
9	layer, and
10	a boundary layer disposed adjacent the first porous layer, the boundary
11	layer preventing cross-over of the liquid fuel;
12	an air/water-side flexible circuit, disposed in parallel with the fuel-side flexible
13	circuit, comprising:
14	a second flex substrate, wherein the second flex substrate comprises
15	openings through which pass water,
16	a second porous layer adjacent the second flex substrate, the second
17	porous layer including a second catalyst layer, and
18	a cathode electrode between the second flex substrate and the second
19	porous layer; and
20	a center section disposed between the first and the second flex circuits, wherein
21	the first and the second flex substrates are conformable to non-planar shapes.
22	2. The flex circuit of claim 1, wherein the center section is a proton exchange
23	membrane.
24	3. The flex circuit of claim 1, wherein the center section is a channel carrying
25	dionized water, the center section further comprising spacers to maintain a separation
26	between the fuel-side flexible circuit and the air/water-side flexible circuit.
27	4. The flex circuit of claim 1, wherein the flex circuit is formed in a shape of a
28	cylinder.
29	5. The flex circuit of claim 4, wherein the liquid fuel is contained within an interior of
30	the cylindrical flex circuit.

HP 10006771-1 10

17

18

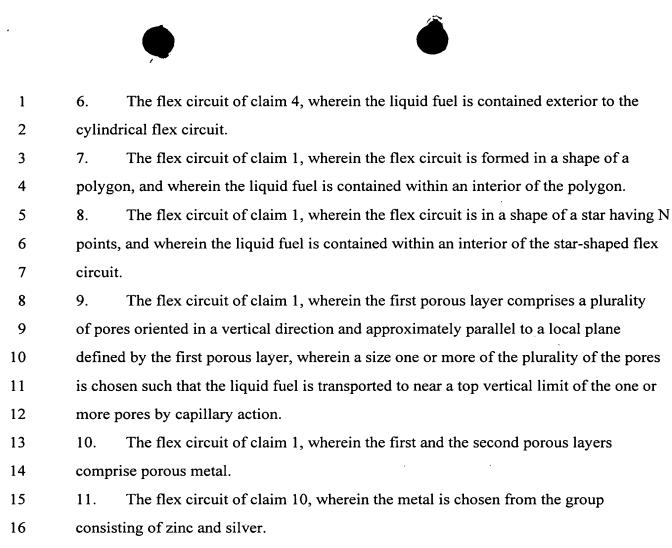
19

20

21

22

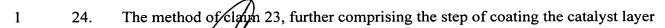
23



- 12. A flex-based fuel cell, comprising:
 - a first flexible circuit; comprising:
 - a first flexible substrate, and
 - a porous metal/catalyst layer, wherein the porous metal/catalyst layer comprises a plurality of pores oriented to distribute fuel to substantially all of the first flexible circuit using a capillary action;
- a separation section adjacent the first flexible circuit; and
- 24 a second flexible circuit adjacent the separation circuit, wherein the first and the 25 second flexible circuits are conformable to a substantially non-planar shape.
- 26 13. The flex-based fuel cell of claim 12, wherein the separation section is a proton exchange membrane.
- 28 14. The flex-based fuel cell of claim 12, wherein the separation section is a channel comprising dionized water.
- The flex-based fuel cell of claim 12, wherein the substantially non-planar shape

1	comprises a cylinder.
2	16. The flex-based fuel cell of claim 15, wherein an interior of the cylindrical flex-
3	based fuel cell comprises liquid fuel.
4	17. The flex-based fuel cell of claim 16, wherein the liquid fuel is methanol.
5	18. The flex-based fuel cell of claim 12, further comprising a dry film adhesive
6	disposed between the first flexible substrate and the second flexible substrate.
7	19. A flex-based fuel cell, comprising:
8	means for donverting liquid fuel to protons, comprising:
9	means for transporting liquid fuel through the liquid fuel converting
10	means, and
11	first means for flexibly supporting the liquid fuel converting means;
12	means for receiving the protons, comprising:
13	means for converting the protons to water vapor, and
14	second means for flexibly supporting the proton converting means; and
15	means for exchanging the protons from the liquid fuel converting means to the
16	proton converting means
17	20. The flex-based fuel cell of claim 19, wherein the liquid fuel transporting means
18	comprises a porous metal layer having means for causing capillary transport of the liquid
19	fuel within the porous metal layer.
20	21. The flex-based fuel cell of claim 19, wherein the proton exchanging means
21	comprises a proton exchange membrane.
22	22. The flex-based fuel cell of claim 19, wherein the proton exchanging means
23	comprises a dionized water channel
24	23. A method of preparing a flex circuit for a fuel cell, comprising:
25	patterning a conductive material on flex supporting means having a front surface
26	and a back surface, wherein the conductive material is patterned on the front surface;
27	attaching a layer of porous material to the conductive material;
28	depositing a layer of catalytic coating on the surface of the porous material; and
29	ablating the supporting means from the back surface to make openings so that
30	the porous material is exposed.

HP 10006771-1 12



with a thin layer of proton transfer membrane.